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| First Named Inventor | Eric J. Erfourth |
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| Examiner Name | David W. Scheuermann |
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**APPEAL BRIEF**


Title: GENERATOR

## APPEAL BRIEF

Mail Stop: Appeal Brief - Patents
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## I. Introduction

Appellant filed a Notice of Appeal to the Board of Patent Appeals and Interferences on May 25, 2007. One copy of this Appeal Brief is hereby filed, in accordance with 37 C.F.R. § 41.37(a)(1), and is accompanied with a check in the amount of $250.00 for the fee as required under 37 C.F.R. § 41.20(b)(2).

## II. Real Party in Interest

The present application has been assigned to Erfurt & Company, a Minnesota business entity having its principal place of business at 5108 N. DuPont Ave., Minneapolis, MN 55430 (hereinafter "Erfurt"), in an assignment from Eric Erfourth recorded at Reel 014255, Frame 0798.

## III. Related Appeals and Interferences

There are no other appeals or interferences known to Appellant that will have a bearing on the Board's decision in the present Appeal.

## IV. Status of Claims

Claims 1-13 and 15-40 are pending in the application. Claim 14 was previously canceled. Claims 25, 28, and 34 are allowed. Claims 1-13 15-24, 26-27, 29-33, and 35-40 are rejected and are the subject of this Appeal. The remaining dependent claims are not separately argued under the provisions of 37 CFR 41.37(c)(1)(vii).

In the Final Office Action mailed February 27, 2007, claims 1-13, 15-23, and 35-40 were rejected under 35 U.S.C. § 112. Claims 1-13, 15-23, and 35-40 were rejected under 35 U.S.C. § 101. Claims 30 and 33 were rejected under 35 U.S.C. § 102(b) as over Adam et al. (EP 429729A1). Claims 31-32 were rejected under 35 U.S.C. § 103(a) over Adam in view of Nahirney (US Patent No. 5,227,702). Claims 24, 26, 27, and 29 were rejected under 35 U.S.C. § 103(a) over Fukuda (US Patent No. 6,147,415) in view of

alleged logical reasoning. Claims 25, 28, and 34 were allowed. See Appendix A for claims involved in this Appeal.

## V. Status of Amendments

All amendments to the claims have been entered.

## VI. Summary of Claimed Subject Matter

Claim 1 is directed to a permanent magnet generator having an exciter mainframe 104 (page 11, lines 9-10, Figures 1-6) with at least one exciter 122 (page 12, lines 1-6), a permanent magnet subassembly 102 (page 11, lines 10-16), and wherein the magnets 106 and 108 are reconfigurable (Figure 8, spec page 13, line 1 through page 14, line 10) for alternating current operation (page 13, line 18 through page 14, line 10; Figures 8, 8b) or direct current operation (page 13, lines 10-17; Figures 8, 8a).

Claim 18 is directed to a permanent magnet generator having a permanent magnet subassembly 102 (page 11, lines 10-16) with toroidal magnets 106 and 108 and wherein the magnets 106 and 108 are reconfigurable (Figures 1, 3, 4, and 8, spec page 13, line 1 through page 14, line 10) for alternating current operation (page 13, line 18 through page 14, line 10; Figures 8, 8b) or direct current operation (page 13, lines 10-17; Figures 8, 8a).; and an exciter mainframe 104 (page 11, lines 9-10, Figures 1-6) with at least one exciter 122 (page 12, lines 1-6).

Claim 24 is directed to a permanent magnet generator having an exciter mainframe and an exciter mainframe 104 (page 11, lines 9-10, Figures 1-6) with at least one exciter 122 (page 12, lines 1-6) having a short helical lead wire 138 (page 14, lines 11-20), first 106 and second 108 reconfigurable magnets (Figure 8, spec page 13, line 1 through page 14, line 10), a connecting arm 118 (Figures 1-6, page 11, line 18), and a drive shaft 112 (Figures 1-6, page 11, line 18).

Claim 27 is directed to a permanent magnet generator having a housing 120 (Figures 1-6, page 11, line 18), a drive shaft 112 (Figures 1-6, page 11, line 18), a reconfigurable (Figure 8, spec page 13, line 1 through page 14, line 10) external magnet

106, an internal magnet 108, and at least one exciter 122 (page 12, lines 1-6) coupled to at least one short helical wire 138 (page 14, lines 11-20).

Claim 30 is directed to an exciter configuration of a permanent magnet generator having an exciter mainframe (page 11, lines 9-10, Figures 1-6) with at least one exciter 122 (page 12, lines 1-6) coupled to at least one short helical wire 138 (page 14, lines 11-20).

Claim 35 is directed to a method for generating electric energy, comprising selecting alternating current (page 13, line 18 through page 14, line 10; Figures 8, 8b) or direct current (page 13, lines 10-17; Figures 8, 8a) generating mode, configuring at least one reconfigurable magnet to correspond with the selected mode (page 13, lines 4-9), disposing at least one exciter 122 within an air gap (page 13, lines 1-5), rotating the at least one reconfigurable magnet with respect to the at least one exciter (page 18, lines 1-17), the reconfigurable permanent magnet generator comprising a plurality of magnets 106 and 108 arranged with an air gap, the magnets arranged to be reconfigurable (Figure 8, spec page 13, line 1 through page 14, line 10) for alternating current operation (page 13, line 18 through page 14, line 10; Figures 8, 8b) or direct current operation (page 13, lines 10-17; Figures 8, 8a).

## VII. Grounds of Rejection to be Reviewed on Appeal

- Whether claims 1-13, 15-23, and 35-40 are unpatentable under 35 U.S.C. § 112.
- Whether claims 1-13, 15-23, and 35-40 are unpatentable under 35 U.S.C. § 101.
- Whether claims 30 and 33 are unpatentable under 35 U.S.C. § 102(b) over Adam et al. (EP 429729A1).
- Whether claims 31-32 are unpatentable under 35 U.S.C. § 103(a) over Adam in view of Nahirney (US Patent No. 5,227,702).
- Whether claims 24, 26, 27, and 29 are unpatentable under 35 U.S.C. § 103(a) over Fukuda (US Patent No. 6,147,415) in view of alleged logical reasoning.

## VIII. Argument

### A. Applicable Authorities

35 U.S.C. § 102

A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference. *Verdegaal Bros. v. Union Oil Co. of California,* 814 F.2d 628, 631, 2 U.S.P.Q.2d 1051, 1053 (Fed. Cir. 1987); (*See,* MPEP §2131). "The identical invention must be shown in as complete detail as is contained in the . . . claim." *Richardson v. Suzuki Motor Co.,* 868 F.2d 1226, 1236, 9 U.S.P.Q.2d 1913, 1920 (Fed. Cir. 1989); (*See,* MPEP §2131). The elements must be arranged as required by the claim, but identical terminology is not required. *In re Bond*, 910 F. 2d 831, 15 U.S.P.Q.2d 1566 (Fed. Cir. 1990); (*See,* MPEP §2131).

Anticipation focuses on whether a claim reads on a product or process disclosed in a prior art reference, not on what the reference broadly teaches. *Kalman v. Kimberly-Clark Corp.,* 713 F.2d 760, 218 U.S.P.Q. 781 (Fed. Cir. 1983). To anticipate a claim, a reference must disclose every element of the challenged claim and enable one skilled in the art to make the anticipating subject matter. *PPG Industries, Inc. v. Guardian Industries Corp.,* 75 F.3d 1558, 37 U.S.P.Q.2d 1618 (Fed. Cir. 1996).

"For a prior art reference to anticipate a claim, the reference must disclose each and every element of the claim with sufficient clarity to prove its existence in the prior art. . . . Although this disclosure requirement presupposes the knowledge of one skilled in the art of the claimed invention, that presumed knowledge does not grant a license to read into the prior art reference teachings that are not there." *Motorola, Inc. v. Interdigital Tech. Corp.*, 121 F.3d 1461, 43 USPQ 2d 1481, 1490 (Fed. Cir. 1997).

35 U.S.C. § 103

35 U.S.C.§103(a) provides in relevant part:

> Conditions for patentability; non-obvious subject matter.
>
> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

"The ultimate determination ... whether an invention is or is not obvious is a legal conclusion based on underlying factual inquiries including: (1) the scope and content of the prior art; (2) the level of ordinary skill in the prior art; (3) the differences between the claimed invention and the prior art; and (4) objective evidence of nonobviousness." *In re Dembiczak*, 175 F.3d 994, 998, 50 USPQ2d 1614, 1616 (1999) (citing *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966)).

When applying 35 U.S.C. §103, the claimed invention must be considered as a whole; the references must be considered as a whole and must suggest the desirability and thus the obviousness of making the combination; the references must be viewed without the benefit of impermissible hindsight vision afforded by the claimed invention and a reasonable expectation of success is the standard with which obviousness is

determined. *Hodosh v. Block Drug Co., Inc.*, 786 F.2d 1136, 1143 n.5, 229 USPQ 182, 187 n.5 (Fed. Cir. 1986).

To establish a *prima facie* case of obviousness, three basic criteria must be met: (1) There must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings; (2) There must be a reasonable expectation of success; (3) The prior art references must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on appellants' disclosure. *In re Vaeck*, 947 F.2d 488, 20 USPQ2d 1438 (Fed. Cir. 1991).

If the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious. *See, e.g., In re Ratti*, 270 F.2d 810, 123 USPQ 349 (CCPA 1959) (Claims were directed to an oil seal comprising a bore engaging portion with outwardly biased resilient spring fingers inserted in a resilient sealing member. The primary reference relied upon in a rejection based on a combination of references disclosed an oil seal wherein the bore engaging portion was reinforced by a cylindrical sheet metal casing. Patentee taught the device required rigidity for operation, whereas the claimed invention required resiliency. The court reversed the rejection holding the "suggested combination of references would require a substantial reconstruction and redesign of the elements shown in [the primary reference] as well as a change in the basic principle under which the [primary reference] construction was designed to operate." 270 F.2d at 813, 123 USPQ at 352.).

Definition of Claim Terms

Where an explicit definition is provided by the applicant for a term, that definition will control interpretation of the term as it is used in the claim. Toro Co. v. White Consolidated Industries Inc., 199 F.3d 1295, 1301, 53 USPQ2d 1065, 1069 (Fed. Cir. 1999)).

## B. Analysis

### (i) Claim Rejections Under 35 U.S.C. § 101

#### (a) General Remarks

The Examiner has maintained a rejection on the basis of 35 U.S.C. § 101 asserting that there is no well established utility to the claimed invention, or that there is no specific and substantial utility identified by Appellant. This is wholly untrue. The claims are directed to generators, specifically to permanent magnet generators. There are hundreds of United States patents issued to permanent magnet generators, or that include permanent magnet generators. Appellant submits that a clear and well established utility exists for generators, and specifically for permanent magnet generators. To suggest otherwise ignores literally hundreds of issued United States patents, and many decades of use of permanent magnet generators in a myriad of applications. It is clear error not to acknowledge the utility of permanent magnet generators.

The Examiner has also maintained a rejection on the basis of 35 U.S.C. § 101 asserting that all configurations of the claimed subject matter result in alternating current, asserting that "[t]his results in an alternating current regardless on (sic) how the magnets are orientated (sic)" (Final Office Action, Page 7). The Examiner commits clear error in this assertion by making the unsupportable argument that an alternating current will result regardless of orientation of magnets in the system. Appellant has submitted evidence (see Appendix A to response filed March 9, 2006) showing that a configuration of magnets oriented in matched polarity, as is recited in the claims 1, 18, 24, 35, and 37, provides a uniform magnetic field. Exciters moving through a uniform magnetic field do not pass through a magnetic field that differs in intensity, as is repeatedly and incorrectly argued by the Examiner (see for example Final Office Action of February 27, 2007, page 7). In contrast, the exciters in this configuration move through a uniform magnetic field, and therefore generate direct current (DC). When the configuration is changed to opposite polarity magnets, alternating current (AC) is generated. This is simple

electromagnetics that the Examiner either cannot understand, or refuses to accept. It is not conjecture. It is fact.

The specification makes it very clear the orientation of the magnets to create uniform magnetic field for DC operation, and a non-uniform magnetic field for AC operation. This is uncontroverted. The Examiner errs in failing to understand the electromagnetics of the operation of the claimed subject matter, and compounds the error by maintaining a rejection despite being provided the evidence for which the Examiner asked.

(b) Claim 1

Claim 1 recites "wherein the plurality of magnets are reconfigurable for alternating current operation wherein the magnetic poles of the first magnet are opposite in polarity to the magnetic poles of the second magnet" for AC operation, and for DC operation when "the magnetic poles of the first magnet are matched in polarity to the magnetic poles of the second magnet." The specification and figures clearly shows these configurations, and shows how to make the device, and how it operates. (See for example, Figure 8, 8a, and 8b, and corresponding text at page 13, line 10 through page 14, line 10.)

(c) Claim 18

Claim 18 recites "wherein the plurality of magnets are reconfigurable for alternating current operation wherein the magnetic poles of the first magnet are opposite in polarity to the magnetic poles of the second magnet" for AC operation, and for DC operation when "the magnetic poles of the first magnet are uniform in polarity to the magnetic poles of the second magnet." The specification and figures clearly show these configurations, show how to make the device, and how it operates. (See for example, Figure 8, 8a, and 8b, and corresponding text at page 13, line 10 through page 14, line 10.)

(d) Claim 35

Claim 35 recites "arranging the magnetic poles of the first magnet opposite in polarity to the magnetic poles of the second magnet to induce current in a first direction for a first 180 degrees and in a second opposite for the other 180 degrees of a 360 degree rotation of the permanent magnet generator for alternating current operation, and arranging the magnetic poles of the first magnet are matched in polarity to the magnetic

poles of the second magnet to uniformly induce current in a single direction for the entire 360 degrees of rotation of the permanent magnet generator for direct current operation." This configuration is further explained in the specification and figures, and how to make the device and how it operates are also shown. (See for example, Figure 8, 8a, and 8b, and corresponding text at page 13, line 10 through page 14, line 10.)

(e) Claim 37

Claim 37 recites that the permanent magnet is "reconfigurable for alternating current or direct current operation." The Examiner interprets this correctly (see Final Office Action February 27, 2007, pages 6-7) as "inversion of magnetic poles" but errs in failing to understand the electromagnetics of the operation of the claimed subject matter. The specification and figures clearly show these configurations, show how to make the device, and how it operates. (See for example, Figure 8, 8a, and 8b, and corresponding text at page 13, line 10 through page 14, line 10.)

(ii) Claim Rejections Under 35 U.S.C. § 112

(a) General Remarks

The Examiner has maintained a rejection on the basis of 35 U.S.C. § 112 again asserting that there is no well established utility to the claimed invention, or that there is no specific and substantial utility identified by Appellant, and compounds his error by a failure to understand the basic physics of the claimed subject matter. The Examiner goes so far as to admit that "the examiner is unable to understand how any voltage potential is generated in a 'constant and uniform' magnetic field" (see Final Office Action of February 27, 2007, page 3) and further admits that "the examiner is not convinced that a coil moving in a constant and uniform magnetic field would generate any voltage potential at all" (see Final Office Action of February 27, 2002, page 4). Appellant is dumbfounded as to how the Examiner fails to understand basic electromagnetics, and respectfully submits that it should not have to educate the Patent Office on basic electromagnetics.

One of ordinary skill in the field certainly understands the basic principles of electromagnetics. A coil or helical wire passing through a magnetic field induces current

in the wire. This is the subject matter of basic electromagnetics. Any number of reference books show this. It is the right hand rule (RHR).

The right hand rule is shown in Exhibit 1 of Appendix B, and is explained basically as follows. The magnets of the claimed subject matter generate a magnetic field. This magnetic field is uniform and constant when the magnets are arranged in DC operation, as is discussed extensively in the specification, and further in the various Office Action responses filed in the application. When an exciter moves through a magnetic field, it has a velocity. The velocity vector and magnetic field vectors are shown in Exhibit 1. The velocity and magnetic field induce a potential in the core of the exciter. This potential follows the right hand rule, and its vector is also shown. With uniform magnetic field and constant velocity, the electric field (E) generated is uniform and constant. The current induced is DC. No rectifier is required. The current is DC.

Appellant also refers the Patent Office to U.S. Patent 6,404,089 issued to Tomion on June 11, 2002. The abstract of that issued patent shows exactly what the Examiner refuses to believe:

> This device is a brushless high-voltage electrical generator, requiring suitable means of input rotary torque, for purposes of producing a very-high-energy external electrodynamic field or continuous quasi-coherent DC corona or arc discharge of uniform current density which completely encloses the machine's conductive housing. ... *Circular arrays of stationary permanent magnets are affixed within the housing which induce a constant DC voltage within said coils upon their rotation.* ... (Emphasis added).

Further, the Examiner has asked again for evidence which has already been submitted. Specifically, the Examiner asked in the Final Office Action of February 27, 2007, for evidence to demonstrate the operability of the device in DC mode. That evidence was previously submitted as Exhibit A to Appellant's response filed December 14, 2006.

Still further, Appellant submits that generators, having been known for decades, and being the subject of hundreds of US Patents, have a clear and well-established general utility. The generation of power is clearly a utility. To suggest otherwise ignores literally hundreds of issued United States patents, and many decades of use of permanent

magnet generators in a myriad of applications. It is clear error not to acknowledge the utility of permanent magnet generators.

The specification makes it very clear the orientation of the magnets to create uniform magnetic field for DC operation, and a non-uniform magnetic field for AC operation. This is uncontroverted. The Examiner errs in failing to understand the electromagnetics of the operation of the claimed subject matter, and compounds the error by maintaining a rejection despite being provided the evidence for which the Examiner asked.

The Examiner cites art entitled "Moving Magnet Generator" for his assertion that a moving magnet passing a coil generates an AC current. A review of that art shows that the magnet does not generate a uniform and constant magnetic field as in the present claims. The art is inapplicable to the generation of DC as the magnetic field of the moving magnet generator is not constant and uniform.

(b) Claim 1

Claim 1 recites "wherein the plurality of magnets are reconfigurable for alternating current operation wherein the magnetic poles of the first magnet are opposite in polarity to the magnetic poles of the second magnet" for AC operation, and for DC operation when "the magnetic poles of the first magnet are matched in polarity to the magnetic poles of the second magnet." The specification and figures clearly shows these configurations, and shows how to make the device, and how it operates. (See for example, Figure 8, 8a, and 8b, and corresponding text at page 13, line 10 through page 14, line 10.)

(c) Claim 18

Claim 18 recites "wherein the plurality of magnets are reconfigurable for alternating current operation wherein the magnetic poles of the first magnet are opposite in polarity to the magnetic poles of the second magnet" for AC operation, and for DC operation when "the magnetic poles of the first magnet are uniform in polarity to the magnetic poles of the second magnet." The specification and figures clearly show these configurations, show how to make the device, and how it operates. (See for example, Figure 8, 8a, and 8b, and corresponding text at page 13, line 10 through page 14, line 10.)

(d) Claim 35

Claim 35 recites "arranging the magnetic poles of the first magnet opposite in polarity to the magnetic poles of the second magnet to induce current in a first direction for a first 180 degrees and in a second opposite for the other 180 degrees of a 360 degree rotation of the permanent magnet generator for alternating current operation, and arranging the magnetic poles of the first magnet are matched in polarity to the magnetic poles of the second magnet to uniformly induce current in a single direction for the entire 360 degrees of rotation of the permanent magnet generator for direct current operation." This configuration is further explained in the specification and figures, and how to make the device and how it operates are also shown. (See for example, Figure 8, 8a, and 8b, and corresponding text at page 13, line 10 through page 14, line 10.)

(e) Claim 37

Claim 37 recites that the permanent magnet is "reconfigurable for alternating current or direct current operation." The Examiner interprets this correctly (see Final Office Action February 27, 2007, pages 6-7) as "inversion of magnetic poles" but errs in failing to understand the electromagnetics of the operation of the claimed subject matter. The specification and figures clearly show these configurations, show how to make the device, and how it operates. (See for example, Figure 8, 8a, and 8b, and corresponding text at page 13, line 10 through page 14, line 10.)

(iii) Claim Rejections Under 35 U.S.C. § 102

(a) Claim 30

Claim 30 recites exciter elements with short helical lead wires. The Examiner errs in failing to understand the difference between a helical lead wire and a coil. The Examiner has asserted in the examiners mind all coils are inherently identical." (See Final Office Action of February 27, 2007, page 5). Appellant respectfully submits that the standard for what is identical should not be what is in the Examiner's mind. Instead, the actual evidence and argument should be considered. Appellant has made those arguments and shown the differences numerous times. (See for example Response filed September 12, 2005, page 12; Response filed March 9, 2006, page 14; Response filed May 9, 2006, page 2; Response filed December 14, 2006, pages 12-14; and specification, page 1, lines 14-16 for coils and page 14, lines 11-20 and Figures 9a and 9b for exciters).

The differences between coils and exciters as the term exciter is used in the present specification and claims are clear. The Examiner's mind is wrong. Coils and exciters (as the term exciter is used in the present specification and claims) are different. Exciter as used in the present specification and claims is different from a coil where energy is created in a wire. Generation of energy in exciters of the present specification and claims is in the core. The core of a coil is electrically insulated from the coil winding. In the present specification and claims, the core is an integral portion of the electron path. Energy is created in a core and a wire transmits current out of the constraints of the mechanical system to an external circuit. The physical length of the exciter helical winding is short, that is, measured in inches and fractions of inches. Generator coil windings are measured in thousands of feet or even miles. It is error to continue to argue that coils and exciters (as used in the present specification and claims) are the same.

Adam et al does not contain exciters. Claim 30 recites exciters. There is a clear difference between the exciters of claim 30 and the coils of Adam. Claim 30, containing elements not present in Adam, is allowable.

(iv) Claim Rejections Under 35 U.S.C. § 103

(a) Claim 24

Claim 24 recites exciters and the details thereof. In response, the Examiner asserts that all the details of an exciter are inherent in Fukada, without providing any support whatsoever. The alleged exciters of Fukada (element 30A and the stators) have long overlapping windings that ate wholly inconsistent with the exciters of the present claim 24. The Examiner is not allowed to provide his own definition that differs from that explicitly stated by Appellant. Coils, such as those shown in the cited art, and exciters, such as those recited in the present claim, are different. Claim 24 is allowable.

(b) Claim 27

Claim 27 recites exciters and the details thereof. In response, the Examiner asserts that all the details of an exciter are inherent in Fukada, without providing any

support whatsoever. The alleged exciters of Fukada (element 30A and the stators) have long overlapping windings that ate wholly inconsistent with the exciters of the present claim 27. The Examiner is not allowed to provide his own definition that differs from that explicitly stated by Appellant. Coils, such as those shown in the cited art, and exciters, such as those recited in the present claim, are different. Claim 27 is allowable.

## IX. Conclusion

Appellant has shown that the claims contain subject matter not present in the cited art. Appellant has also shown that the Examiner has erred in interpreting basic rules of electromagnetics, which has resulted in error in rejecting the claims. A well established utility exists for the claimed subject matter. Appellant has shown that the application clearly describes how to make and use the claimed subject matter. Appellant has shown that is it error for the Examiner to maintain the rejections.

For at least the reasons discussed above, Appellant submits that the pending claims are patentable. Accordingly, Appellant requests that the Board of Appeals reverse the Examiner's decisions regarding claims 1-13 and 15-40.

Respectfully submitted,

Date: 25 Sept. 2007

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## APPENDIX A

## Claims Appendix

1. A permanent magnet generator comprising:

an exciter mainframe comprising at least one exciter element; and

a permanent magnet subassembly comprising a plurality of magnets that are arranged to form at least one air gap between facing magnetic poles in which the at least one exciter resides, the plurality of magnets comprising a first toroidal magnet of the plurality of magnets having a first magnetic pole and a second magnetic pole, and a second toroidal magnet of the plurality of magnets having a first magnetic pole and a second magnetic pole, the first and second magnetic poles of the second magnet facing the magnetic poles of the first magnet;

wherein the plurality of magnets are reconfigurable for alternating current operation wherein the magnetic poles of the first magnet are opposite in polarity to the magnetic poles of the second magnet to induce current in a first direction for a first 180 degrees and in a second opposite for the other 180 degrees of a 360 degree rotation of the permanent magnet subassembly, or direct current operation wherein the magnetic poles of the first magnet are matched in polarity to the magnetic poles of the second magnet to induce current in a single direction for the entire 360 degrees of rotation of the permanent magnet subassembly.

2. The permanent magnet generator of claim 1,

wherein the first magnetic pole of the first magnet and the first magnetic pole of the second magnet face to form a first air gap in which a first at least one exciter element resides, and wherein the second magnetic pole of the first magnet and the second magnetic pole of the second magnet face to form a second air gap in which a second at least one exciter element resides.

3. The permanent magnet generator of claim 1, wherein the at least one exciter mainframe comprises at least 90 exciter elements configured side by side in a 360-degree ring with a uniform separation between each exciter element.

4. The permanent magnet generator of claim 1, wherein the at least one exciter mainframe comprises at least 120 exciter elements configured side by side in a 360-degree ring with a uniform separation between each exciter element.

5. The permanent magnet generator of claim 2, wherein the first magnet comprises at least a first segment and a second segment, and wherein the second magnet comprises at least a first segment and a second segment.

6. The permanent magnet generator of claim 1, wherein each of the plurality of magnets comprises a plurality of reconfigurable magnet segments.

7. The permanent magnet generator of claim 5, wherein:

the first magnetic pole of the first magnet and the second magnetic pole of the second magnet are of a first polarity;

the second magnetic pole of the first magnet and the first magnetic pole of the second magnet are of a second polarity, wherein the second polarity is opposite the first polarity such that the facing magnetic poles have opposite polarities; and

the at least first and second opposing segments of each the first magnet and the second magnet have matched abutting magnetic poles such that the permanent magnet generator operably produces a direct current output.

8. The permanent magnet generator of claim 5, wherein:

the first magnetic pole of the first magnet and the second magnetic pole of the second magnet are of a first polarity; and

the second magnetic pole of the first magnet and the first magnetic pole of the second magnets are of a second polarity, wherein the second polarity is opposite the first polarity such that the facing magnetic poles have opposite polarities; and

wherein the at least first and second segments of each the first magnet and the second magnet have inverse abutting magnetic poles such that the permanent magnet generator operably produces an alternating current output.

9. The permanent magnet generator of claim 1, wherein the at least one exciter element further comprises:

a conductive core;

a helical lead wire; and

a plurality of alternating layers of a first material and a second material.

10. The permanent magnet generator of claim 9, wherein the first material comprises a superconductive material and the second material comprises a non-superconductive material, and wherein the layers of the superconductive material are thin relative to the thickness of the layers of the non-superconductive material.

11. The permanent magnet generator of claim 10, wherein the exciter mainframe further comprises a coolant enclosure, wherein the coolant enclosure operably communicates with the exciter mainframe to communicate a coolant to at least one exciter element, and wherein the coolant enclosure encloses a coolant.

12. The permanent magnet generator of claim 1, wherein the permanent magnet subassembly further comprises:

an external magnet comprising a first magnetic pole and a second magnetic pole, wherein the first magnetic pole and the second magnetic pole oppose each other to form the air gap in which the at least one exciter element resides; and

a secondary internal magnet.

13. The permanent magnet generator of claim 12, wherein the first magnet is chosen from a set consisting of: a unitary magnet, a two segment magnet assembly, a four segment magnet assembly, or an eight segment magnet assembly.

15. The permanent magnet generator of claim 13, wherein each segment has a first magnetic pole of a first polarity and a second magnetic pole of a second polarity, and wherein the first polarity is comparatively opposite the second polarity, and wherein the

first magnetic pole of each segment is adjacent to the second magnetic pole of an abutting segment, and wherein the permanent magnet generator operably produces alternating current.

16. The permanent magnet generator of claim 13, wherein each segment has a first magnetic pole of a first polarity and a second magnetic pole of a second polarity, and wherein the first polarity is comparatively opposite the second polarity, and wherein the first magnetic pole of each adjacent segment is uniform to the first magnetic pole of an adjacent segment, and wherein the permanent magnet generator operably produces direct current.

17. The permanent magnet generator of claim 12, further comprising a housing, wherein the housing further comprises a plurality of teeth disposed on an interior circumferential surface of the housing, and wherein the plurality of teeth engage a plurality of notches disposed on an exterior circumferential surface of the external magnet to operably hold the external magnet in place relative to the housing.

18. A permanent magnet generator comprising:

a permanent magnet subassembly comprising a first toroidal magnet and a second toroidal magnet arranged to form at least one air gap between facing magnetic poles of the first and the second magnets, wherein the plurality of magnets are reconfigurable for alternating current operation wherein the magnetic poles of the first magnet are opposite in polarity to the magnetic poles of the second magnet to induce current in a first direction for a first 180 degrees and in a second opposite for the other 180 degrees of a 360 degree rotation of the permanent magnet subassembly, or direct current operation wherein the magnetic poles of the first magnet are uniform in polarity to the magnetic poles of the second magnet to induce current in a single direction for the entire 360 degrees of rotation of the permanent magnet subassembly; and

an exciter mainframe subassembly comprising at least one exciter element residing in the at least one air gap.

19. The permanent magnet generator of claim 18, wherein the first magnet and the second magnet each comprise a plurality of reconfigurable magnet segments.

20. The permanent magnet generator of claim 18, wherein the first magnet comprises a first inward-facing magnetic pole and a second inward-facing magnetic pole, wherein the second magnet comprises a first outward-facing magnetic pole and a second outward-facing magnetic pole, wherein the first magnetic poles form a first air gap and the second magnetic poles form a second air gap, and wherein a first at least one exciter element resides in the first air gap and a second at least one exciter element resides in the second air gap.

21. The permanent magnet generator of claim 18, wherein the at least one exciter element comprises alternating layers of a superconductive material and a non-superconductive material.

22. The permanent magnet generator of claim 18, wherein the first magnet comprises an external magnet having a first magnetic pole and a second magnetic pole opposed to form the at least one air gap, wherein the second magnet comprises an internal magnet, and wherein the at least one exciter element resides in the air gap.

23. The permanent magnet generator of claim 22, wherein the at least one exciter element comprises alternating layers of a superconductive material and a non-superconductive material.

24. A permanent magnet generator comprising:

an exciter mainframe;

a first at least one exciter element coupled to the exciter mainframe and residing in a first air gap, the first at least one exciter element coupled to at least one short helical lead wire;

a second at least one exciter element coupled to the exciter mainframe and residing in a second air gap, the second at least one exciter element coupled to at least one short helical lead wire;

a first reconfigurable magnet;

a second reconfigurable magnet;

a connecting arm coupled to the first reconfigurable magnet and the second reconfigurable magnet; and

a drive shaft coupled to the connecting arm; and

wherein the first reconfigurable magnet includes a first magnet having a first magnetic pole and a second magnetic pole, and the second reconfigurable magnet includes a first magnetic pole and a second magnetic pole, the first and second magnetic poles of the first magnet facing the magnetic poles of the first reconfigurable magnet.

26. The permanent magnet generator of claim 24, wherein the first reconfigurable magnet and the second reconfigurable magnet each comprise a plurality of reconfigurable magnet segments.

28. A permanent magnet generator comprising:

a housing;

a drive shaft;

a reconfigurable external magnet coupled to the drive shaft and enclosed by the housing;

an internal magnet coupled to the drive shaft; and

at least one exciter residing in an air gap defined by the external magnet, the at least one exciter element coupled to at least one lead wire;

wherein the at least one exciter comprises alternating layers of a superconductive material and a non-superconductive material.

29. The permanent magnet generator of claim 27, wherein the reconfigurable external magnet comprises a plurality of reconfigurable magnet segments.

30. An exciter configuration of a permanent magnet generator wherein the exciter configuration comprises:

an exciter mainframe;

at least one exciter element coupled to the mainframe; and

at least one short helical lead wire, the at least one short helical lead wire coupled to the at least one exciter element.

31. The exciter configuration of claim 30, wherein the at least one exciter mainframe comprises at least 90 exciter elements.

32. The exciter configuration of claim 30, wherein the at least one exciter mainframe comprises at least 120 exciter elements.

33. The exciter configuration of claim 30, wherein the at least one exciter further comprises a plurality of alternating layers of a first material and a second material, wherein the layers of the first material are thin relative to the layers of the second material.

35. A method for generating electric energy using a reconfigurable permanent magnet generator comprising:

selecting an alternating current or a direct current generation mode;

configuring at least one reconfigurable magnet to correspond with the selected generation mode;

disposing at least one exciter in an air gap defined by the at least one reconfigurable magnet; and

rotating the at least one reconfigurable magnet relative to the at least one exciter;

wherein the reconfigurable permanent magnet generator comprises a plurality of magnets that are arranged to form at least one air gap between facing magnetic poles in which the at least one exciter resides, the plurality of magnets comprising a first toroidal magnet of the plurality of magnets having a first magnetic pole and a second magnetic pole, the first and second magnetic poles of the first magnet facing inwardly, and a

second toroidal magnet of the plurality of magnets having a first magnetic pole and a second magnetic pole, the first and second magnetic poles of the second magnet facing outwardly toward the inward-facing magnetic poles of the first magnet, and wherein selecting an alternating current or a direct current generation mode comprises:

arranging the magnetic poles of the first magnet opposite in polarity to the magnetic poles of the second magnet to induce current in a first direction for a first 180 degrees and in a second opposite for the other 180 degrees of a 360 degree rotation of the permanent magnet generator for alternating current operation, and arranging the magnetic poles of the first magnet are matched in polarity to the magnetic poles of the second magnet to uniformly induce current in a single direction for the entire 360 degrees of rotation of the permanent magnet generator for direct current operation.

36. The method of claim 35 further comprising:

mounting a plurality of reconfigurable permanent magnet generators on a single spindle; and

generating a plurality of electric energy outputs.

37. A permanent magnet generator comprising:

permanent magnet means defining at least one air gap, the permanent magnet means reconfigurable for alternating current or direct current generation;

exciter means residing in the at least one air gap for conducting induced current; and

drive means for rotating the permanent magnet means relative to the exciter means to induce current flow in the exciter means and generate electric energy.

38. The permanent magnet generator of claim 37, wherein the permanent magnet means comprise at least a first reconfigurable magnet and a second reconfigurable magnet.

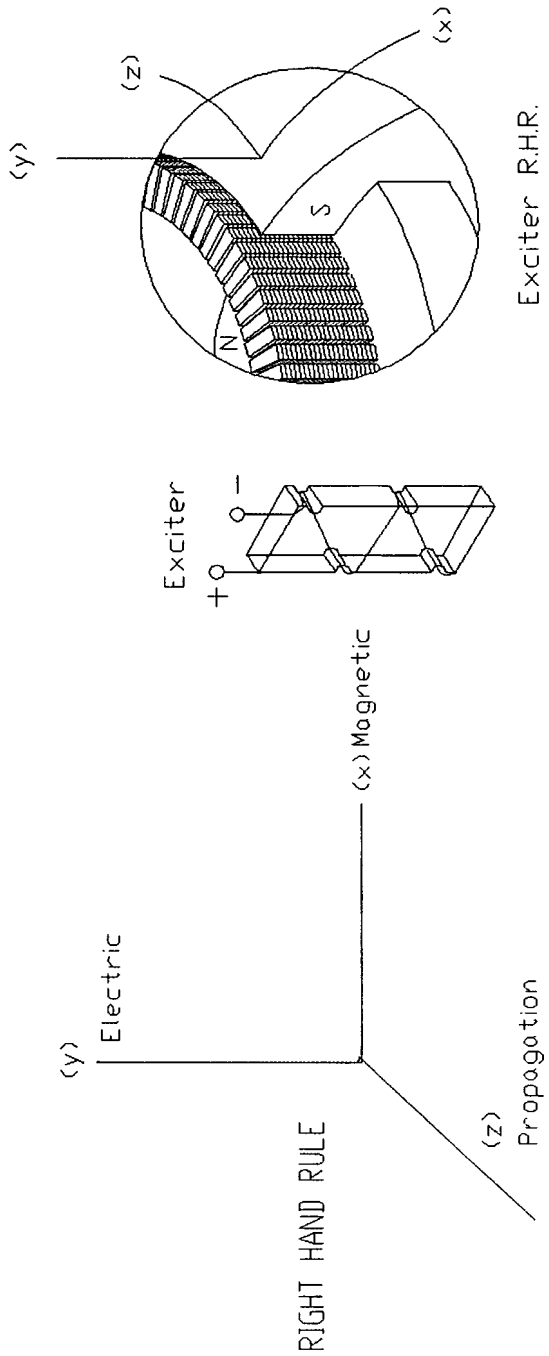
39. The permanent magnet generator of claim 38, wherein the first reconfigurable magnet and the second reconfigurable magnet each comprise a plurality of reconfigurable magnet segments.

40. The permanent magnet generator of claim 2, wherein the first magnet is chosen from a set consisting of: a unitary magnet, a two segment magnet assembly, a four segment magnet assembly, or an eight segment magnet assembly.

# APPENDIX B

## Evidence Appendix

Exhibit 1



## APPENDIX C

## Related Proceedings Appendix

There are no related proceedings to be considered in this Appeal. Therefore, no such proceedings are identified in this Appendix.